ABSTRACT

THESIS: Antihypertensive Medications and Maximal Exercise Blood Pressure Response

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DATE: May 2022

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Hypertensive individuals are more likely to have an exaggerated blood pressure response to exercise. Current research is limited on the impact of chronic treatment with antihypertensive medications on the exercise blood pressure response. **Purpose:** To determine if individuals on antihypertensive medications, specifically angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), and calcium channel blockers (CCBs) have a normal blood pressure response to maximal exercise. **Methods:** Participants were 2,555 apparently healthy adults from the Ball State Adult fitness Longitudinal Lifestyle STudy (BALL ST) cohort. Participants were placed in four groups based on medication status and resting blood pressure at the time of the test: normotensive-unmedicated, hypertensive-unmedicated, hypertensive-medicated, and normotensive-medicated. Peak systolic blood pressure (SBP) and the change in SBP (ΔSBP) were analyzed between groups by sex using a univariate analysis of variance (ANOVA). Further, an analysis of covariance (ANCOVA) was performed to control for age. A chi-squared test was used to determine the prevalence of normal, exaggerated, and blunted responses within each group. **Results:** Peak SBP was lower in the

normotensive-unmedicated group compared to all hypertensive groups, regardless of medication status in women ($p<0.05$). In men, peak SBP was lower ($p<0.05$) in both normotensive groups compared to the hypertensive groups. Δ SBP was not different ($p>0.05$) between groups in men or women after controlling for age. The normotensive-unmedicated group had the lowest ($p<0.05$) incidence of exaggerated response compared to all hypertensive groups regardless of medication status, with the absolute blood pressure classification. The FRIEND percentiles found the distribution of the two normotensive groups were different ($p<0.05$) than the hypertensive groups. **Conclusion:** Individuals with uncontrolled hypertension have the highest peak SBP and greatest incidence of exaggerated blood pressure responses. The change in SBP was not different between groups. Further, the absolute classification and FRIEND percentiles resulted in different distributions of outcomes.